Staff Summary
Method 2B Application

Clean Energy
Billings Regional Landfill from Billings, Montana, to Compressed Natural Gas, Liquefied Natural Gas, and Liquefied-Compressed Natural Gas Delivered in California
(Pathway Codes: CNG057, CNG058, and LNG036)

Deemed Complete Date: December 18, 2015
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Pathway Summary

Clean Energy has applied for three landfill-gas-to-biomethane fuel pathways. The landfill gas (LFG) for all three pathways is extracted from the Billings Regional Landfill in Billings, Montana. The first pathway covers the liquefaction of the resulting biomethane at Clean Energy's Boron, California liquefaction facility and the dispensing of the fuel as liquefied natural gas (LNG); the second pathway covers the liquefaction of the resulting biomethane at Clean Energy's Boron, California liquefaction facility and the subsequent vaporization and compression of the liquefied natural gas into compressed natural gas (L-CNG); and the final pathway covers the compression of the biomethane for dispensing at CNG fueling stations. All fueling stations covered by these pathways are located in California.

LFG from the Billings Regional Landfill is treated using grid electricity. Processed LFG and natural gas is used in the thermal oxidizer and flare pilot. The thermal oxidizer and flare are used to destroy LFG when the processing plant is not fully operational.

The Clean Energy pathways utilize the CA-GREET1.8b default values for LFG recovery. To determine combustion emissions from the consumed purified LFG, the flare and the thermal oxidizer, the CA-GREET1.8b default values for natural gas combustion in a turbine were used. These emissions are more representative of operations at the Billings Regional Landfill plant than emission factors for a natural gas powered compressor.

The biomethane Clean Energy purchases from the Billings Regional LFG processing plant is injected into the interstate pipeline system for conveyance to Clean Energy's LNG plant in Boron, California. The pipeline transport distance is 3,296 miles. As such, Clean Energy will be obligated to retain records that unequivocally demonstrate that the credits it earns under the pathways described in this Summary correspond directly with the volumes of biomethane it purchases from the Billings Regional Landfill in Billings, Montana.

Carbon Intensity of CNG, LNG, and L-CNG Produced

As shown in table below, the applicant has calculated the CIs of its CNG, L-CNG, LNG and LNG pathways to be 45.24, 51.88, and 49.76 gCO_2e/MJ, respectively.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (gCO_2e/MJ)		
			Direct Emissions	Land Use or Other Indirect Effects	Total
CNG from LFG	CNG057	2B Application*: Montana landfill gas to pipeline-quality biomethane; delivered via pipeline; compressed to CNG in CA	45.24	0	45.24
L-CNG from LFG	CNG058	2B Application*: Montana landfill gas to pipeline-quality biomethane, delivered via pipeline, liquefied in CA; transported by trucks; re-gasified and compressed to L-CNG in CA	51.88	0	51.88
LNG from LFG	LNG036	2B Application*: Montana landfill gas to pipeline-quality biomethane; delivered via pipeline; liquefied to LNG in CA	49.76	0	49.76

* Specific Conditions Apply.

Operating Conditions

1. Actual pathway energy consumption values shall remain at or below the levels specified in Clean Energy's application. These pathways were calculated using two years LFG production data from July, 2012 to June, 2014 and LNG liquefaction and CNG compression data covering calendar years 2011 and 2012. The recovery and processing efficiency levels at the Billings Regional Landfill in Billings, Montana shall remain at or above the levels specified in the Clean Energy's application[1]. In addition, the liquefaction efficiency at the Boron LNG plant and the compression efficiency level at the L-CNG stations in California shall remain at or above the levels specified in the application. Energy consumption values for

[1] Clean Energy assumed recovery and processing efficiencies equivalent to those used in pathway LNG007: http://www.arb.ca.gov/fuels/lcfs/022709lcfs_lfg.pdf

these facilities are classified by the applicant as confidential business information.

2. Because the biomethane supplied under this pathway is commingled with fossil NG both when it enters the interstate pipeline system and when it enters Clean Energy's Boron liquefaction facility, Clean Energy must maintain an accounting system that will enable it to demonstrate unequivocally at any time that every unit of biomethane-based transportation fuel sold and reported under the LCFS can be associated with an equal unit of biomethane purchased from the Billings Regional Landfill.

Staff Analysis and Recommendations

Staff has reviewed Clean Energy's application for the production of CNG, L-CNG, and LNG from LFG originating in Billings, Montana. Staff has replicated the CI values calculated by Clean Energy using the CA-GREET1.8b spreadsheet. Clean Energy has provided documentation in support of the key components of its pathways: energy consumption at the Billings Regional LFG processing plant, the California liquefaction plant, and Clean Energy's California CNG fueling stations. It has also provided the volumes of LNG and CNG produced. Staff is satisfied that the energy consumption levels reported in Clean Energy's application accurately represent actual usage for the time period for which records were submitted, and that Clean Energy is capable of maintaining CIs that are at or below those shown in the table above. Therefore, staff recommends that Clean Energy's application for Method 2B LFG-to-CNG, LFG-to-LNG, and LFG-to-L-CNG pathways be certified.